

## CLAIMS

What is claimed is:

- 1     1.     An apparatus for closing a chamber, the chamber having a first chamber housing and a  
2           second chamber housing, comprising:  
3                 means for forming a chamber including means for bringing the first chamber  
4           housing into contact with the second chamber housing; and  
5                 deforming means for preventing formation of particles while the first chamber  
6           housing contacts the second chamber housing, wherein the deforming means is mounted  
7           on at least one of the first chamber housing and the second chamber housing such that it  
8           deforms to accommodate any misalignment while the means for forming a chamber  
9           operates.
- 1     2.     The apparatus of claim 1 wherein the first chamber housing includes a first interior  
2           surface defining a first cavity.
- 1     3.     The apparatus of claim 2 wherein the first interior surface defining a first cavity is sized  
2           to contain a semiconductor wafer for forming integrated circuits.
- 1     4.     The apparatus of claim 2 wherein the second chamber housing includes a second interior  
2           surface defining a second cavity.
- 1     5.     The apparatus of claim 4 wherein the second interior surface defining a second cavity is  
2           sized such that when juxtaposed with the first cavity a region thereby formed is  
3           sufficiently sized to contain a semiconductor wafer for forming integrated circuits.
- 1     6.     The apparatus of claim 1 wherein the first chamber housing is mounted to a structure for  
2           stabilizing the first chamber housing while the first chamber housing contacts the second  
3           chamber housing.

- 1     7.     The apparatus of claim 6 wherein the second chamber housing is driven by a motivating  
2           structure, being constructed and arranged to move the second chamber housing in and out  
3           of contact with the first chamber housing.
- 1     8.     The apparatus of claim 7 wherein the motivating structure is powered by at least one of a  
2           pneumatic source, a hydraulic source, a turbine, and a motor.
- 1     9.     The apparatus of claim 7 wherein the motivating structure comprises:  
2           a body defining a casing; and  
3           a moveable member, being positioned in the casing and being reciprocable along  
4           an axis between a first position and a second position, wherein the second chamber  
5           housing contacts the first chamber housing while the moveable member is in the first  
6           position, and wherein the second chamber housing is not in contact with the first chamber  
7           housing while the moveable member is in the second position.
- 1     10.    The apparatus of claim 9 wherein the deforming means comprises at least one of a  
2           material between a surface of the first chamber housing and a surface of the structure to  
3           which the first chamber housing is mounted, a material between a surface of the second  
4           chamber housing and a surface of the motivating structure, and a material between a  
5           surface of the moveable member and a surface of the casing.
- 1     11.    The apparatus of claim 10 wherein the material comprises an abrasion resistant material  
2           characterized by high impact strength and having a low coefficient of friction.
- 1     12.    The apparatus of claim 10 wherein the material comprises at least one of polyether ether  
2           ketone (PEEK™), thermoplastic resin, polyolefin type resin, polyamide resin, polyester  
3           resin, polyether resin, polynitrile resin, polymethacrylate resin, polyvinyl resin, cellulose  
4           resin, fluorine resin and a composition of PEEK™ and at least one of resins and fillers.
- 1     13.    The apparatus of claim 1 further comprising alignment means for reducing an amplitude  
2           of relative motion between the first chamber housing and the second chamber housing  
3           while the first chamber housing contacts the second chamber housing.

- 1     14.     The apparatus of claim 13 wherein the alignment means comprises a first chamber  
2           housing feature adapted to engage with a second chamber housing feature to particularly  
3           position the second chamber while the first chamber housing contacts the second chamber  
4           housing.
- 1     15.     The apparatus of claim 14 wherein at least one of the first chamber housing feature and  
2           the second chamber housing feature comprises a protrudance, wherein the protrudance  
3           has a particularly shaped outer edge adapted to interfit with a recess defined in at least  
4           one of the first chamber housing and the second chamber housing.
- 1     16.     The apparatus of claim 13 wherein the alignment means comprises a pin-like structure  
2           located on at least one of the first chamber housing and the second chamber housing and  
3           an aperture defined in at least one of the first chamber housing and the second chamber  
4           housing to securely receive the pin-like structure.
- 1     17.     The apparatus of claim 16 wherein the aperture is elongated in shape and has at least one  
2           chamfered inner wall adapted to facilitate alignment of the aperture with the pin-like  
3           structure.
- 1     18.     The apparatus of claim 1 wherein at least one of the first chamber housing and the second  
2           chamber housing comprises a manifold having thereon a plurality of fluid outlets for  
3           distributing a process fluid.
- 1     19.     The apparatus of claim 1 further comprising means for performing a supercritical process.
- 1     20.     The apparatus of claim 19 wherein the means for performing a supercritical process  
2           comprises means for circulating at least one of gaseous, liquid, supercritical and near-  
3           supercritical carbon dioxide in the chamber.

- 1     21.     A method of closing a chamber, the chamber having a first chamber housing and a second  
2             chamber housing, comprising the steps of:
- 3             a.       forming a chamber including bringing the first chamber housing into contact with  
4                   the second chamber housing; and
- 5             b.       preventing formation of particles while the first chamber housing contacts the  
6                   second chamber housing.
- 1     22.     The method of claim 21 wherein the step of forming a chamber comprises moving the  
2             second chamber housing in and out of contact with the first chamber housing.
- 1     23.     The method of claim 21 wherein the step of preventing formation of particles comprises  
2             positioning a material on at least one of the first chamber housing and the second  
3             chamber housing such that the material deforms to accommodate any misalignment while  
4             forming a chamber.
- 1     24.     The method of claim 23 wherein the material comprises an abrasion resistant material  
2             characterized by high impact strength and having a low coefficient of friction.
- 1     25.     The method of claim 23 wherein the material comprises at least one of polyether ether  
2             ketone (PEEK<sup>TM</sup>), thermoplastic resin, polyolefin type resin, polyamide resin, polyester  
3             resin, polyether resin, polynitrile resin, polymethacrylate resin, polyvinyl resin, cellulose  
4             resin, fluorine resin and a composition of PEEK<sup>TM</sup> and at least one of resins and fillers.
- 1     26.     The method of claim 21 wherein the step of preventing formation of particles comprises  
2             configuring an alignment means for reducing an amplitude of relative motion between the  
3             first chamber housing and the second chamber housing while the first chamber housing  
4             contacts the second chamber housing.
- 1     27.     The method of claim 26 wherein the step of employing an alignment means comprises  
2             configuring a first-chamber-housing feature to engage with a second-chamber-housing  
3             feature to particularly position the second chamber while the first chamber housing  
4             contacts the second chamber housing.

- 1      28.    The method of claim 21 further comprising processing an object with a fluid.
- 1      29.    The method of claim 28 wherein the step of processing an object with a fluid comprises  
2           processing a semiconductor wafer with at least one of gaseous, liquid, supercritical and  
3           near-supercritical carbon dioxide.
- 1      30.    A method of eliminating particle generation at a platen/injection ring interface,  
2           comprising the steps of:  
3           a.       forming a platen/injection ring interface including bringing a platen into contact  
4                   with an injection ring; and  
5           b.       positioning a material on at least one of the injection ring and the platen such that  
6                   the material deforms to accommodate any misalignment while forming the  
7                   platen/injection ring interface.
- 1      31.    A method of 30 further comprising the step of configuring an alignment means for  
2           reducing an amplitude of relative motion between the platen and the injection ring while  
3           the platen contacts the injection ring.
- 1      32.    The method of claim 30 further comprising the step of processing a semiconductor wafer  
2           with at least one of gaseous, liquid, supercritical and near-supercritical carbon dioxide.